UAS MODELING OF DINOSAUR RIDGE, CO – ROCKFALL HAZARD SURVEY

BACKGROUND

Dinosaur Ridge is a segment of the Dakota Hogback in the Morrison Fossil Area National Natural Landmark located in Jefferson County, Colorado, near the town of Morrison, west of Denver.

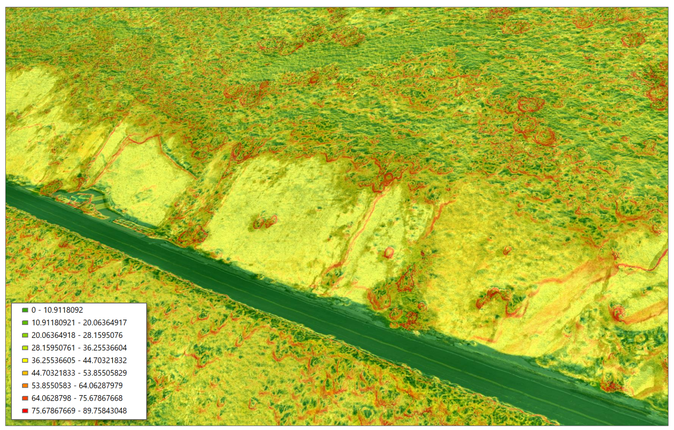
The Dinosaur Ridge area is one of the world's most famous dinosaur fossil localities. In 1877, some of the best-known dinosaurs were found here, including Stegosaurus, Apatosaurus, Diplodocus, and Allosaurus. The rocks on the west side of Dinosaur Ridge are part of the widespread Morrison Formation of Jurassic age. The rocks on the east side of Dinosaur Ridge are part of the Cretaceous Dakota Formation. In 1973, the area was recognized for its uniqueness as well as its historical and scientific significance and it was designated the Morrison Fossil Area National Natural Landmark by the National Park Service.

In 1989, the Friends of Dinosaur Ridge formed to address increasing concerns regarding the preservation of the site and to offer educational programs on the area's resources. Their mission is to educate the public about, and ensure the preservation of, the natural and historic resources of Dinosaur Ridge, Triceratops Trail, and the surrounding areas. *Source: Friends of Dinosaur Ridge*

Photo: Cretaceous iguanodon and theropod tracks on the east side of Dinosaur Ridge

3D textured surface model of track taken from a Nikon D810 close range

Photo: Loose rocks of the Dakota Formation hang on a 30 degree slope near the dinosaur ridge trackway



Slope calculations (in degrees) generated from the UAS Digital Surface Model (DSM)

The 3DR Solo was utilized with a Ricoh GR II camera for the photogrammetric surveys. Flight plans were conducted using mission planner software.

UAS DATASETS

2 Textured 3D Surface Models
2698 Camera Stations (Total for 2 Sites)
Flying Altitude 36 m
Ground Resolution: 0.92 cm
Total area covered: 0.3 km²

UAS PROJECT INFORMATION

Dinosaur Ridge is undertaking a project to enhance the visitation experience, increase general safety and improve the protection of the paleontological resources. A core component of the improvement plan is geologic hazard analysis and rockfall mitigation of the Dinosaur Ridge Park. Nearly all of the exhibits lie at the bottom of an unstable slope which requires monitoring to protect visitors and to protect the natural park resources. USGS collaborated with the Jefferson County Open Space, and the Friends of Dinosaur Ridge to collect high-resolution UAS data, constructing 3D photogrammetric terrain models of potential landslide areas, providing planners the required data for park enhancement and safety.

3D textured surface model of Dinosaur Ridge taken with the Ricoh GR II camera

3D textured surface model of Dinosaur Ridge taken with the Ricoh GR II camera

U.S. GEOLOGICAL SURVEY - NATIONAL UNMANNED AIRCRAFT SYSTEMS PROJECT OFFICE
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